Parko

ELECTRONICS COMPANY , INC. SANTA ANA, CALIFORNIA.

ENGINEERING SPECIFICATION 1535A

FUNCTIONAL AND FINAL TEST PROCEDURES

PARKO P/N 101535 (A)

HUGHES AIRCRAFT COMPANY

VOLTAGE SENSING RELAY

PARKO ELECTRONICS COMPANY, INC,

Prepared by:

Approved by:

Date: 5-5-99

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ELECTRONICS COMPANY INC. SANTA ANA, CALIFORNIA

ENGINEERING SPECIFICATION 1535A
FUNCTIONAL & FINAL TEST PROCEDURE
P/N 101535 (A)

1.0 REFERENCES

1.1 HUGHES AIRCRAFT, FULLERTON DWG. #719728-A
1.2 PARKO ELECTRONICS DWG. #101535A
1.3 APPENDIX I, FUNCTIONAL INSPECTION RECORD
1.4 APPENDIX II, FINAL INSPECTION RECORD
1.5 APPENDIX III, TEST SET-UP #1
1.6 APPENDIX IV, TEST SET-UP #2
1.7 APPENDIX V, TEST SET-UP #3

2.0 TEST EQUIPMENT

2.1 TE-1149 AR HY-POT TESTER
2.2 TE-1150 GR 1864 MEGOHMMETER
2.3 TE-1115 SIMPSON 270 MULTIMETER
2.4 TE-1192 H.P. 33401A DIGITAL VOLTMETER
2.5 TE-1174 PACIFIC 308-THREE PHASE POWER SUPPLY
2.6 TE-1185 H.P. 5316B COUNTER/TIMER
2.7 TE-1084 H.P. 6217A DC POWER SUPPLY
2.8 TE-1186 ISOLATION TRANSFORMER
2.9 TE-1187 PARKO TEST JIG/VOLTAGE BOX

3.0 TEST REQUIREMENTS

3.1 All tests to be performed at room temperature (approximately 25°C) unless otherwise specified.

3.2 After 100% of the lot size have passed all final tests, and all test columns of the Functional or Final Inspection Record have been checked off, sign the Shop Order in the appropriate space.

3.3 If a unit fails to meet the requirements of this specification, it shall be rejected. If the unit is repairable, and after repairs have been made, it may be resubmitted for final test with the approval of the Quality Control Department.

4.0 TEST PROCEDURE

4.1 DIELECTRIC STRENGTH AND INSULATION RESISTANCE

4.1.1 Using the TE-1149 HY-POT Tester, set at 1000VRMS/60Hz, check the Dielectric Strength between all pins and case. Observe that no arcing or breakdown is indicated.

4.1.2 Using the TE-1150 Megommeter, set at 500 VDC, check for a minimum insulation resistance of 100 megohms between all pins and case.

4.2 VOLTAGE TEST PROCEDURE

4.2.1 Set up test equipment per Appendix III. Turn the TE-1174 AC Power Supply set to 400 HZ. Using the TE-1192 Digital Voltmeter, adjust Phase A, Phase ~~D~~ B and Phase C to 115VRMS, Turn the power supply "OFF" and insert the unit to be tested into the 10 pin socket.

4.2.2 Nominal Operation: While monitoring the TE-1015 Multimeter, turn the AC Power Supply "ON" and verify that the relay contacts have tranferred to the energized position. (Pins 5-6 and Pins 8-9 are closed, and that Pins 6-7 and Pins 9-10 are open.)

4.2.3 Phase Sequence: While monitoring the TE-1015 Multimeter, change the phase sequence from ABC, to BCA or CBA. The relay contacts should transfer to the de-energized position (Pins 6-7 and Pins 9-10 closed and Pins 5-6 and Pins 8-9 open). Return the phase sequence to ABC and the relay contacts should transfer to the energized positions.

4.2.4 Overvoltage Trip Point: Verify that the three (3) phases are a 115VRMS. While monitoring the TE-1192 Digital Voltmeter and the TE-1015 Multimeter, use the TE-1174 Power Supply voltage control to slowly and simultaneously raise the three phase voltage until the relay trips, and the contacts transfer. The trip voltage should be 138VRMS +/- 2V (136 to 140V). Slowly decrease the three phase voltage until the relay resets. The reset differential should be a maximum of 2% of the trip point. (135.24V at 138V trip point.)

4.2.5 Undervoltage Trip Point: Verify that the three phases are at 115VRMS. While monitoring the meters, slowly decrease the three phase voltage simultaneously until the relay trips and the contacts transfer. The trip point should be 92VRMS +/- 2V. (90 to 94V). Slowly increase the three phase voltage simultaneously until the relay resets. Reset differential should be a maximum of 2% of the trip point. (90.16VRMS at 92VRMS.)

4.3 TIMING

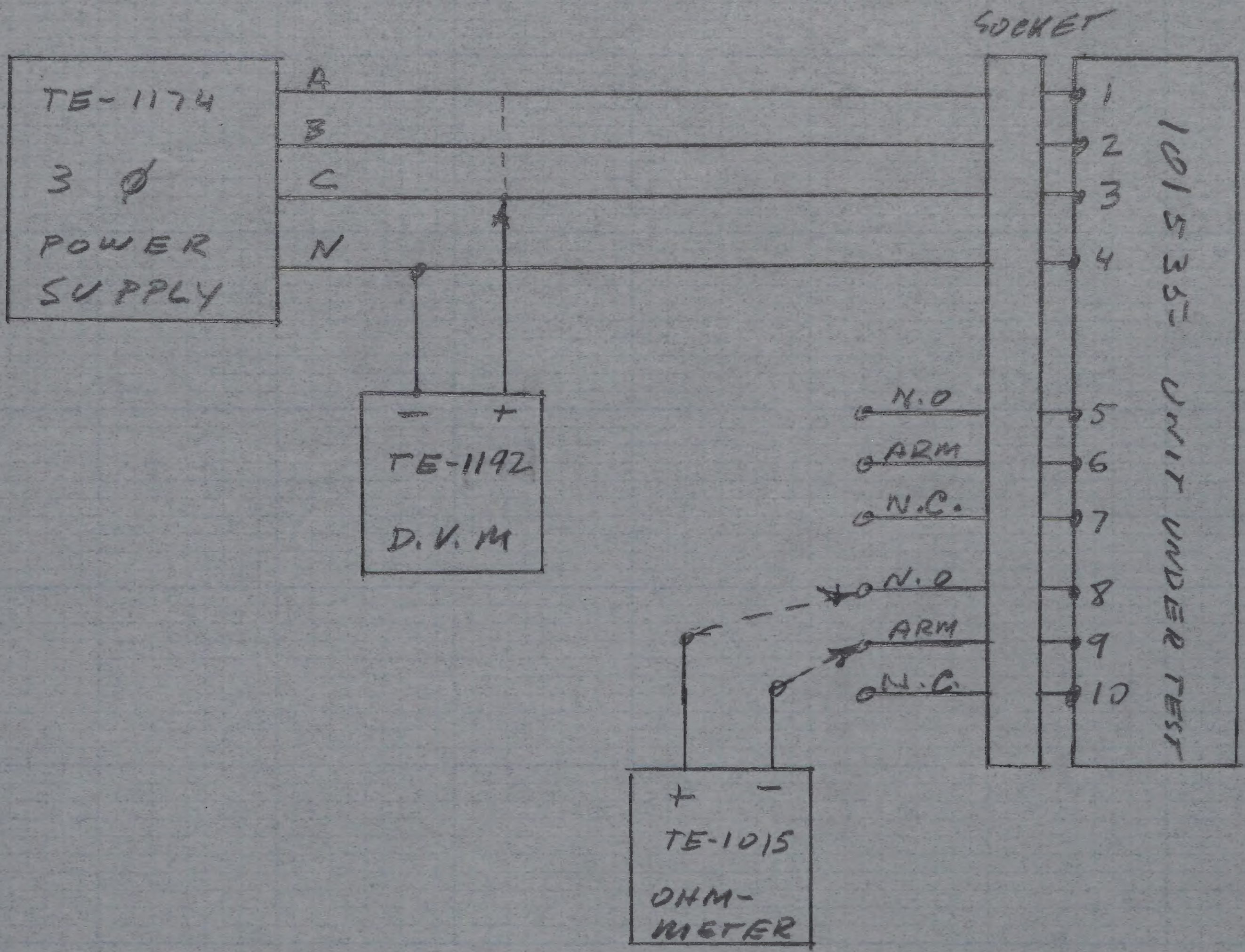
4.3.1 Nominal Power-Up Time Delay: Connect test equipment per Appendix V Test Set-Up #3. Set CHA. "A" of TE-1185 to +, start and adjust trigger input to 115 VAC. Set CHA. "B" to +, start and adjust trigger input to 1 VDC. Depress "T1 Delay" button and adjust "Gate Time Delay" to mid-point between "Min and Max".

Turn TE-1174 Power Supply "ON" and adjust to 115 VAC. Turn Power Supply "OFF". Insert the unit into the 10 pin test socket. Turn the TE-1084 DC Power Supply "ON" and while monitoring the TE-1185 Counter turn the TE-1174 Power Supply "ON". The time delay should be from 0.9 to 1.1 sec.

4.3.2 Trip Timing: Connect the test equipment per Appendix IV Test Set-Up #2. On the TE-1187 turn switch "ON" and adjust the three phase output of the TE-1174 A.C. Power Supply to 115VRMS using the CTR(R9) pot. Depress the "PUSH" button switch and using up/down (R7) pot adjust output to 151.8VRMS. Set the start and stop CHA. of the counter to +trigger. Turn the TE-1174 A.C. Power Supply "OFF".

4.3.3 Trip Timing: Insert the unit into the 10 pin socket. Turn the TE-1174 A.C. Power Supply "ON" . While monitoring the TE-1185 Counter, depress the push-button on the TE-1187 Test Jig. The trip timing from 115VRMS to 151.8VRMS should 25MS to 45MS.

While holding the push button switch down, adjust R7 on the TE-1187 Test Jig to 82.8VRMS output. Release the push button while monitoring the TE-1185 Counter, depress it again. The trip timing from 115VRMS to 82.8VRMS should be 25MS to 45MS.



APPENDIX III TO ES-1535A
TEST SET-UP #1

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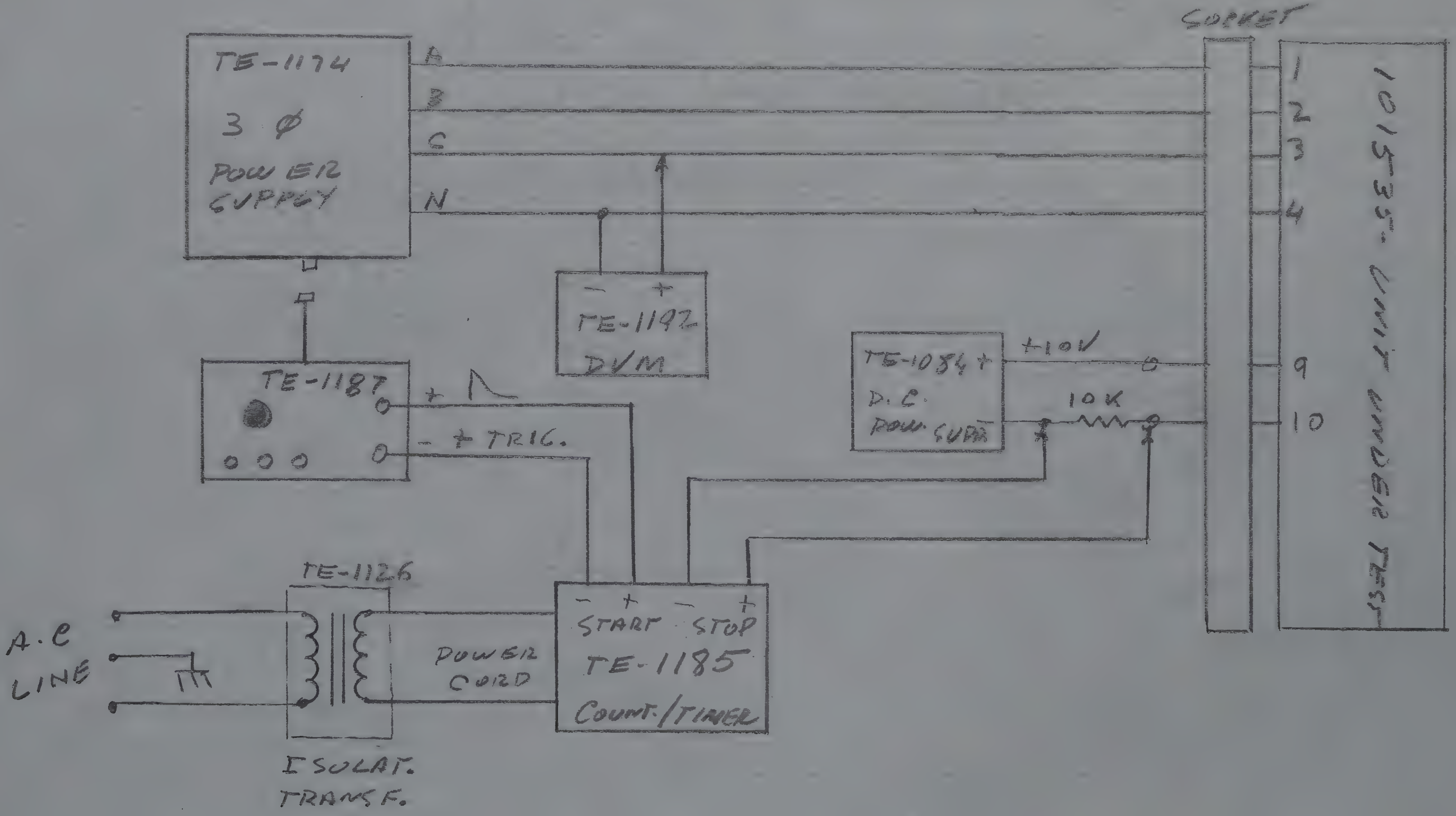

APPENDIX IV TO ES-1535A

TEST SET-UP #2

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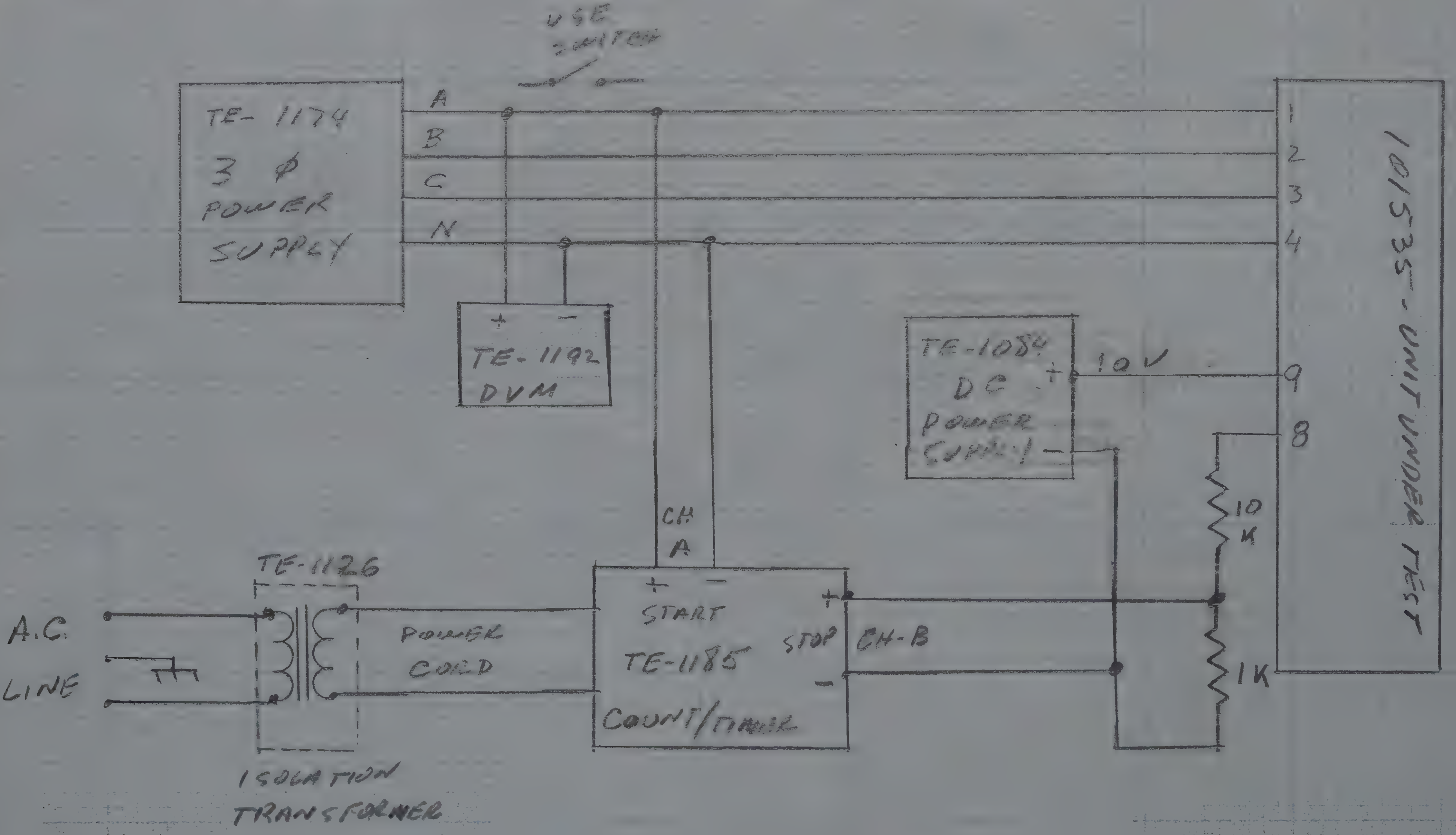

APPENDIX V TO ES-1535A

TEST SET UP #3

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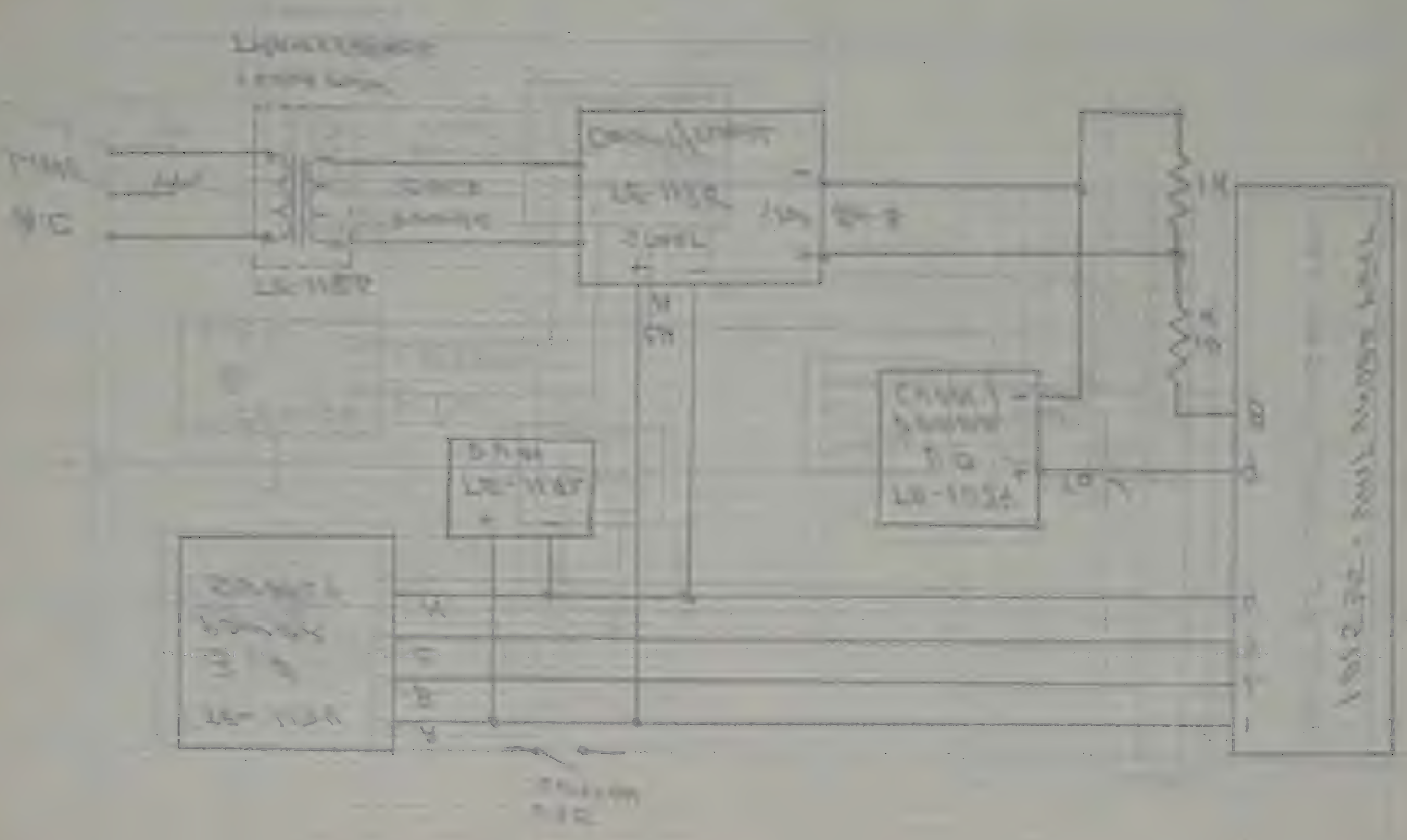
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ELECTRONICS COMPANY, INC. SANTA ANA CALIFORNIA

SEE REVISION A

ENGINEERING SPECIFICATION 1535
FUNCTIONAL AND FINAL TEST PROCEDURE
PARKO P/N 101535
HUGHES AIRCRAFT COMPANY

VOLTAGE SENSING RELAY

PARKO ELECTRONICS COMPANY, INC
Prepared by:
Approved by:
Date: JUNE-21-1990

ENGINEERING SPECIFICATION ES 1535
FUNCTIONAL AND FINAL TEST PROCEDURES
PARKO P/N 101535

1.0 REFERENCES

1.1 HUGHES AIRCRAFT, FULLERTON DWG. #719728-1
1.2 PARKO ELECTRONICS DWG. #101535
1.3 APPENDIX I - FUNCTIONAL INSPECTION RECORD
1.4 APPENDIX II - FINAL INPSECTION RECORD
1.5 APPENDIX III - TEST SET-UP #1
1.6 APPENDIX IV - TEST SET-UP #2

2.0 TEST EQUIPMENT

2.1 TE-1149 AR HY-POT TESTER
2.2 TE-1150 GR 1864 MEGOHMMETER
2.3 TE-1015 SIMPSON 270 MULTIMETER
2.4 TE-1123 FLUKE 8300A DIGITAL VOLTMETER
2.5 TE-1174 PACIFIC 308-THREE PHASE POWER SUPPLY
2.6 TE-1140 HEWLETT PACKARD 5320 COUNTER/TIMER
2.7 TE-1084 HEWLETT PACKARD 6217A DC POWER SUPPLY
2.8 TE-1186 ISOLATION TRANSFORMER
2.9 TE-1187 PARKO TEST JIG/VOLTAGE BOX

3.0 TEST REQUIREMENTS

3.1 All tests are to be performed at room temperature (approximately 25°C) unless otherwise specified.

3.2 After 100% of the lot size have passed all final tests, and all test columns of the Functional or Final Inspection Record have been checked off, sign the Shop Order in the appropriate space.

3.3 If a unit fails to meet the requirements of this final test specification it shall be rejected. If the unit is repairable, and after repairs have been made, it may be resubmitted for final test with the approval of the Quality Control Department.

4.0 TEST PROCEDURES

4.1 DIELECTRIC STRENGTH AND INSULATION RESISTANCE

4.1.1 Using the TE-1149 AR HY-POT Tester set at 1000VRMS/60HZ, check for Dielectric Strength between all pins and case. Observe that no arcing or breakdown is indicated.

4.1.2 Using the TE-1150 GR 1864 Megohmmeter set at 500VDC, check or minimum Insulation Resistance of 100 megohms between all pins and case.

4.2 VOLTAGE TEST PROCEDURE

4.2.1 Set up test equipment per Appendix III. Turn the TE-1174 AC Power Supply set to 400HZ. Using the TE-1123 Digital Voltmeter, adjust Phase A, Phase D and Phase C to 115VRMS. Turn the power supply "OFF" and insert the unit to be tested into the 10 pin socket.

4.2.2 Nominal Operation: While monitoring the TE-1015 Multimeter, turn the AC Power Supply "ON" and verify that the relay contacts have transferred to the energized position. (Pins 5-6 and Pins 8-9 are closed, and that Pins 6-7 and 9-10 are open.)

4.2.3 Phase Sequence: While monitoring the TE-1015 Multimeter, change the phase sequence from ABC, to BCA or CBA. The relay contacts should transfer to the de-energized position (Pins 6-7 and Pins 9-10 closed and Pins 5-6 and Pins 8-9 open). Return the phase sequence to ABC and the relay contacts should transfer to the energized positions.

4.2.4 Overvoltage Trip Point: Verify that the three phases are a 115VRMS. While monitoring the TE-1123 Digital Voltmeter and the TE-1015 Multimeter, use the TE-1174 Power Supply voltage control to slowly and simultaneously raise the three phase voltage until the relay trips, and the contacts transfer. The trip voltage should be 138VRMS ± 2V (136 to 140V). Slowly decrease the three phase voltage until the

relay resets. The reset differential should be a maximum of 2% of the trip point. (135.24V at 138V trip point.)

4.2.5 Undervoltage Trip Point: Verify that the three phases are at 115VRMS. While monitoring the meters, slowly decrease the three phase voltage simultaneously until the relay trips and the contacts transfer. The trip point should be 92VRMS ± 2V. (90 to 94V). Slowly increase the three phase voltage simultaneously until the relay resets. Reset differential should be a maximum of 2% of the trip point. (90.16VRMS at 92VRMS)

4.3 TRIP TIMING

4.3.1 Connect the test equipment per Appendix IV Test Set-Up #2. On the TE-1187 turn switch "ON" and adjust the three phase output of the TE-xxxx A.C. Power Supply to 115VRMS using the CTR(R9) pot. Depress the "PUSH" button switch and using up/down (R7) pot adjust output to 151.8VRMS. Set the start and stop CHA. of the counter to + trigger. Turn the TE-xxxx A.C. Power Supply "OFF".

4.3.2 Insert the unit into the 10 pin socket. Turn the TE-1174 A.C. Power Supply "ON". While monitoring the TE-1140 Counter, depress the push-button on the TE-1187 Test Jig. The trip timing from 115VRMS to 151.8VRMS should be 25MS to 45MS.

While holding the push button switch down, adjust R7 on the TE-1187 Test Jig to 82.8VRMS output. Release the push button while monitoring the TE-1140 Counter, depress it again. The trip timing from 115VRMS to 82.8VRMS should be 25MS to 45MS.

Parko's Voltage Sensing Relay 101535.

Adjustment Procedure:

Follow Par. 4.2 of ES-1535A.

At Par. 4.2.4 and with the three phases at 138VRMS, adjust R 14 for a relay Trip and contacts transfer as measured by multimeter.

At Par. 4.2.5 and with the three phases at 92VRMS, adjust R 20 for a relay trip and contacts transfer as measured by multimeter.